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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,712	11/09/2001	Jerry Schlagheck	15186-12US" JA/lm	5856

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EXAMINER

GUADALUPE, YARITZA

ART UNIT PAPER NUMBER

2859

DATE MAILED: 03/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/986,712

Applicant(s)

SCHLAGHECK ET AL.

Examiner

Yaritza Guadalupe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2001 and 25 March 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.                      6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 17, 22 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Vachtsevanos et al. ( US 6,269,179 ).

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Vachtsevanos et al. discloses an apparatus for inspecting comprising a mounting ( 18 ) for mounting said object under inspection, said object being a Printed Circuit Board ( PCB ), a pulsed laser source ( 12, 27 ) having a beam able to be positioned for providing a heat pulse at a predetermined location on said object ( See Column 4, lines 55 – 56 ), a thermal infrared camera ( 16, 26 ) for capturing thermal images of said object, a frame grabber ( See Column 5, lines 25 – 26 ) for capturing a sequence of image signals from the infrared camera ( 16 ), a memory unit for storing data representative of heat diffusion resulting from said heat pulse and an analyzing unit for comparing said heat diffusion data to a reference data set provided in the computer ( 22 ).

Vachtsevanos et al. further discloses said mounting comprising a stage ( 18 ) allowing said object to be moved in the X and Y direction ( See Column 5, lines 37 – 39 ), and a controller also disposed in said computer ( 22 ) programming an entire sequence of points ( See Column 6, lines 7 – 8 ) on said object and causing said mounting to align sequentially each point of said sequence of points to said laser. Vachtsevanos et al. a focusing optical mechanism including a lens and fiber optic array, an illumination technique and filters for controlling the pulsed laser source directed to the object which inherently teaches the use of an optical power attenuator.

With respect to claims 1 – 16 : the method for inspecting an object comprising the steps of injecting a heat pulse by light beam at a selected point on an object, capturing a sequence of consecutive thermal images of said object to record heat diffusion, comparing said heat diffusion to a reference and determining whether said object comprises any defects as stated in claims 1 - 16 can be met by the regular operation of the apparatus disclosed by Vachtsevanos et al.

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vachtsevanos et al. 9 US 6,269,179 ).

Vachtsevanos et al. discloses an apparatus as stated in paragraph 2 above.

Vachtsevanos et al. does not discloses the mounting means comprising register pins as stated in claim 21.

Regarding claim 21 : Vachtsevanos et al. discloses an apparatus having a mounting stage movable in X and Y direction. The use of the particular type of mounting claimed by applicant, i.e., register pins, absent any criticality, is considered to be nothing more than a choice of engineering skill, choice or design because 1) neither non-obvious nor unexpected results, i.e., results which are different in kind and not in degree from the results of the prior art, will be obtained as long as a mounting support is provided for the object under inspection as already

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suggested by Vachtsevanos et al., 2) the mounting claimed by Applicant and the mounting used by Vachtsevanos et al. are well known alternate types of mounting supports which will perform the same function, if one is replaced with the other, of providing a mounting support for the object under inspection, and 3) the use of the particular type of mounting support by Applicant is considered to be nothing more than the use of one of numerous and well known alternate types of mounting support that a person having ordinary skill in the art would have been able to provide using routine experimentation in order to provide a mounting support for the object under inspection as already suggested by Vachtsevanos et al.

5. Claims 18 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vachtsevanos et al. ( US 6,269,179 ) in view of Moran ( US 5,127,726 ).

Vachtsevanos et al. discloses an apparatus as stated in paragraph 2 above.

Vachtsevanos et al. does not disclose the X – Y galvanometer as stated in claims 18 – 20.

With respect to claims 18 – 20 : Moran discloses an apparatus for surface inspection comprising a rotating galvanometer ( 52, 52a ) for aligning a pulsed laser source ( 51 ) to a precise location on the object ( W ) under inspection through an input/output interface ( 52a ) which will control said galvanometer. Therefore, it would have been obvious to a person having ordinary skill in the art the time the invention was made to add a rotatable galvanometer as

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taught by Moran to the apparatus disclosed by Vachtsevanos et al. in order to enhance the accuracy of the process and reduce the focusing and aiming time of the laser to the object while in motion during inspection.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vachtsevanos et al. ( US 6,269,179 ) in view of Nakata et al. ( US 5,250,809 ).

Vachtsevanos et al. discloses an apparatus as stated in paragraph 2.

Vachtsevanos et al. does not discloses the mounting also movable in the Z direction.

Regarding claim 23 : Nakata et al. discloses a device for checking comprising a mounting table ( 43 ) for support of the object ( 44 ) under inspection, said mounting comprising a stage movable in X in Y and in Z direction. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to replace the mounting stage disclosed by Vachtsevanos et al. with a stage movable in the X, Y and Z direction as taught by Nakata et al. in order to increase the range of inspection as well as decreasing the alignment time during inspection.

*Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are considered to be relevant to the present application :

- a. Vachtsevanos et al. ( US 5,963,662 )
- b. Goldstein ( US 4,827,125 )
- c. Fukumoto et al. ( US 5,580,471 )
- d. Shirley ( US 6,031,612 )
- e. Schlagheck ( US 5,294,198 )
- f. Sasnett et al. ( US 6,287,299 )
- g. Mitchell ( US 6,345,127 )
- h. Prikryl et al. ( US 6,493,094 )

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaritza Guadalupe whose telephone number is (703)305 -5676. The examiner can normally be reached on 9:00 AM - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F.F. Gutierrez can be reached on (703) 308-3875. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-4467 for regular communications and (703)872-9318 for After Final communications.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.



Yaritza Guadalupe  
Patent Examiner  
Art Unit 2859  
March 15, 2003

DIEGO F.F. GUTIERREZ  
SUPERVISOR PATENT EXAMINER  
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